Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

BIOLOGY: CP1 Unit Test

Multiple Choice: Circle the BEST answer below

1. A dominant allele:
   1. Is one whose trait always shows up in the phenotype
   2. Is represented by a capital letter
   3. Can be paired with a recessive allele
   4. All of the above
2. Genes are located on:
   1. Chromosomes
   2. Dominant Alleles
   3. Recessive Alleles
   4. Our legs
3. Which of the following is an example of a homozygous dominant genotype:
   1. AA
   2. Aa
   3. aa
4. Which of the following is an example of a heterozygous genotype:
   1. AA
   2. Aa
   3. Aa
5. When both kinds alleles are present but neither are dominant it is called:
   1. Genotype
   2. Dihybrid
   3. Co-dominance
   4. Genetics
6. 1 type of cross used by Mendel which studies 2 traits at once is:
   1. a monohybrid cross
   2. a dihybrid cross
   3. a trihybrid cross
   4. a punnett square
7. The end result of meiosis is:
   1. 4 haploid cells
   2. 4 diploid cells
   3. 2 haploid cells
   4. 2 diploid cells
8. Crossing over occurs during \_\_\_\_\_\_\_\_\_\_ between \_\_\_\_\_\_\_\_\_\_\_\_:
   1. Prophase I, nonsister chromatids
   2. Metaphase II, homologous chromosomes
   3. Anaphase I, homologous chromosomes
   4. Anaphase II, nonsister chromatids
9. 2n refers to:
   1. haploid # of chromosomes
   2. diploid # of chromsomes
   3. genetic mutations
   4. nothing, I made it up
10. An example of a gamete is:
    1. Sperm
    2. Chromosome
    3. Egg
    4. 2 of the above

Examine the table, then answer the questions:

|  |  |  |
| --- | --- | --- |
| **Organism** | **Body Cell**  **(2n)** | **Gamete**  **(n)** |
| Human | 46 | 23 |
| Garden Pea | 14 | 7 |
| Fruit Fly | 8 | 4 |
| Tomato | 24 | 12 |
| Dog | 78 | 39 |

1. What is the diploid number of chromosomes in a garden pea?
2. What is the haploid number of chromosomes in a garden pea?
3. Is the chromosome number related to the complexity of the organism?
4. How many pairs of chromosomes do humans have?
5. What process maintains a constant number of chromosomes within a species?

Label the diagram below. Hint: EVERY stage of meiosis is used!

Match the definition in Column A with the term in Column B

Column A Column B

1. The different forms of a gene A. Crossing Over
2. The alleles present for B. Homozygous

a trait are the same

C. Fertilization

1. A cell that contains one

member of each chromosome pair D. Meiosis

1. The type of cell division that produces gametes E. Nondisjunction
2. The cell produced when a

male gamete fuses with a female gamete F. Zygote

1. The uniting of the male and female gametes G. Haploid
2. The exchange of genetic material

between nonsister chromatids H. Alleles

1. The failure of homologous chromosomes I. F1

to separate properly during meiosis

J. F2

1. The offspring of the P1 generation
2. The offspring of the F1 generation

Below I have given you the outline for a dihybrid cross. Fill it with a cross two parents that are both heterozygous for tallness (Tt) and round seeds (Rr). Include the ratios of each genotype and phenotype.

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Short Answer: Answer each question with a few sentences (3-4).

1. Mitosis is known as the process of *cell replication* while meiosis is known as *cell reduction*. Explain why they were given these nicknames. HINT: include the steps and products of each.
2. We discussed in class that Gregor Mendel was dubbed, “The Father of Genetics.” What discoveries did he make which led to this nickname?

1. Create a Punnett Square for a heterozygous male and a homozygous recessive female (explain what trait you are crossing, the ratio of the cross, and each genotype/phenotype that is present).

Critical Thinking:

1. A women with brown hair and brown eyes marries a man with these same traits, however, their daughter is born with blonde hair and blue eyes! The man thinks that is wife has cheated on him! Convince him using your knowledge of Mendelien Genetics that he very well indeed could be the father of this blonde hair, blue-eyed child. In your answer be sure to include a dihybrid cross and the probability ratio.
2. You overhear another science teacher talking about how Mendel’s RULES are not related to Mendel’s LAWS! Luckily for you, you just came from Mr. Ennis’ science class so you would like to politely correct the teachers’ mistake. Write down what you would say in order to show the connection between Mendel’s two rules & two laws.

EXTRA CREDIT CHALLENGE QUESTION!!!!

In class we have learned about monohybrid and dihybrid crosses. We know that monohybrid crosses involve only one trait and dihybrid involves two. We also know how to set up the Punnett Squares for these crosses as well.

CHALLENGE: Set up the Punnett Square for a TRIHYBRID cross between two individuals that are heterozygous for Tallness (Tt), Brown Eyes (Bb) and Red hair (Rr).